

Approach for Integrating ICT in Teaching-Learning Process

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Abstract-- With the rapid pace of technological and scientific development, the educational technology has also transformed quite significantly. The teaching-learning process has been upgraded with the aid of computers in many ways from traditional method to modern system. Substantiating these trends, today's teaching-learning is being conducted through e-learning, mobile-learning, web-based learning, multi-media learning, etc. All these technological advancements in imparting learning would bring interest, curiosity and enhance imagination, problem solving ability and aggressive thinking capacity which will augur well for research and development for younger generation. As Internet is becoming the worldwide classroom, the accessibility to information becomes reality at any point of time. Learning of professional courses requires such modern type of tools to make the learning very meaningful.

This paper emphasizes that the potential of new technologies to support innovation towards more student-centred approaches in the learning environment will only be realised if the use of new technologies is prescribed within the context of the whole curriculum. Against this background an approach for planning for technology use in the teaching and learning environment is presented.

I. INTRODUCTION

Modernization of education has become an essential aspect of knowledge base in each and every domain of various faculties of education. The rapid pace with which world is changing is phenomenal which warrant a dynamic way of teaching and learning. These developments in education demand a value based, purpose and technology based learning which can be promoted by using of multimedia tools that makes the learning flexible, need based and objective oriented. As the education process is becoming globally competitive, competent talent has to be developed among the learners to grasp the required knowledge in a specific domain.

It is argued in this paper that new technologies be considered part of a toolset which can be used in formulating a pedagogical solution to the key problem of increasing the effectiveness of the teaching-learning environment. A planning approach that places primary focus on the teaching process rather than on technology and thus supports the appropriate use of new technologies in the learning environment is proposed. The planning approach is based on student-centred philosophy and the notion of reflective practice. The approach presented thus focuses attention to some issues for the development of professional development initiatives aimed at increasing effective technology use in educational settings.

II. INFORMATION AND COMMUNICATION TECHNOLOGY IN EDUCATION

With the advent of computers there is a phenomenal development in all the fields of education, research, inventions, innovations and also living styles of human life and their social status. The world is witnessing many innovations and

inventions, which are modernizing the human race in many ways. All these have become a possibility due to the facilitation offered by ICT. Supplementing these developments are the learning methodologies, which emerged with the evolution of computers. Such learning methodologies being e-learning, web-based learning, multimedia learning, etc. Internet provision provides every one easy access to the necessitated information without any hassle and difficulty. In the present day context, such emerging learning techniques have become the order of the day and this provision also develops creativity and imagination in the minds of learners. At the same time teachers also facilitate the learners to become more active in their learning process.

Both computer and web based multimedia materials encompasses content that are itself dynamic in nature. But the content of technology based learning environment has the potential to engage all the stakeholders in the education system – starting from software developers to educational researchers to teachers and students. Technologies can be broken into two basic categories; asynchronous, in which communication does not occur in "real-time" and synchronous, where work is done over networks in "real-time". Asynchronous technologies include traditional correspondence courses, e-mail, database and message boards. There are advantages to asynchronous learning, especially when hypermedia is used. Learners are able to review in depth the materials, compose critical responses and attend to the learning with a level of comfort and confidence. Synchronous technologies include various "chat" applications, streaming audio and streaming video. These media allow for more collaborative work, brainstorming and more constructive learning.

A. Types of Technology based Learning Environment

a. M-learning

'M-learning' is the follow up of E-learning which for its part originates from D-learning (distance education). M-learning is the delivery of learning to students who are not keeping a fixed location or through the use of mobile or portable technology. The rapid growth of ICT makes it possible to develop new forms of this education. M-learning is the term given to the delivery of training by means of mobile devices such as mobile phones, PDA's (Personal Digital Assistants) and digital audio players, as well as digital cameras and voice recorders, pen scanners etc.

b. E-Learning

E-learning is an approach to learning and development: a collection of tools and techniques utilizing digital technologies, which enable, distribute and enhance learning. If e-learning took learning away from the classroom or campus, then m-learning is taking learning away from a fixed point. While e-learning is an alternative to classroom learning (actually e-Learning should/can be complementary to classroom learning), m-learning is a complementary activity to both e-learning and traditional learning. In one sense m-

learning has been around for longer than e-learning, with the paperback book and other portable resources, but technology is what shapes today's usage of m-learning.

c. Teleconferencing – Audio, Video, Computer and Desktop

There are different types of teleconferencing audio, video, and computer conferencing including desktop videoconferencing, but they all provide some form of two-way interaction. Regardless of the exact nature of the teleconference, a good moderator is required to keep the discussion focused and on schedule. A particularly effective teleconference technique is to have a local activity at each site that prepares participants for the broadcast event. A common way is to organize a local panel of experts to discuss the same issues covered by the main presenters, but in the local context.

This allows for greater participation at each site. The most common form of teleconferencing is satellite teleconferences which involve one-way television broadcasts and two-way audio links. Digital videoconferencing provides even more interactive capability because it involves two-way audio and video transmission between each site. In a well-organized audio-conference, an agenda, the list of participants and any other required materials will be delivered to everyone well in advance.

d. Interactive Multimedia – Expanding Computer-Based Training

Interactive multimedia implies two important capabilities:

1. To be able to present information in multiple modalities and
2. To allow the user to control the interaction to varying degrees depending on the nature of the program.

These have to be done to the extent that almost all forms of learning are enhanced by involving multiple modalities and by having interactions.

Benefits of multimedia for learning include: increased motivation, appeal to different learning styles, more realism, facilitation of multilingual presentations, higher retention, better comprehension and improved transfer of skills. Multimedia technology makes it easy to create and capture information in different forms as well as present it. If designed properly, multimedia programs can be motivating and realistic. Another ongoing challenge is the constant emergence of new multimedia capabilities. Even before a program is completed and fielded, it is likely that some of the multimedia features will be enhanced in newer versions of software and hardware. Because such a wide range of skills/knowledge is needed to develop multimedia programs, a team approach is recommended.

e. Web-Based Training (WBT)

The WBT uses web-based technologies for the purpose of training. WBT can be used to deliver complex training, such as a sales training course for a worldwide sales team. The main attributes of WBT are listed below:

1. Several WBTs offer mentoring and coaching services, which allow learners to interact with the instructor over e-mail, chat forums, or videoconference.
2. Several WBTs offer learners the opportunity to interact and collaborate with peers in discussions in chat groups, collaborate on projects, or participate in online seminars.
3. Learners in remote locations can use the courses any time.

4. Multiple media such as text, graphics, video and animations are used to communicate the content.
5. Questions, quizzes, simulations and feedback provide interaction with the student.

III. PEDAGOGY DESIGN

Research has shown that the appropriate use of ICTs can catalyze a paradigm shift in both content and pedagogy that is at the heart of education reform in the 21st century. If designed and implemented properly, ICT-supported education can promote the acquisition of the knowledge and skills that will empower students for lifelong learning.

When used appropriately, ICTs enable new ways of teaching and learning rather than simply allow teachers and students to do what they have done before in a better way. These new ways of teaching and learning are underpinned by constructivist theories of learning and constitute a shift from a teacher-centered pedagogy—in its worst form characterized by memorization and rote learning—to one that is learner-centered.

As learning shifts from the “teacher-centered model” to a “learner-centered model”, the teacher becomes less the sole voice of authority and more the facilitator, mentor and coach—from “sage on stage” to “guide on the side”. The teacher’s primary task becomes to teach the students how to ask questions and pose problems, formulate hypotheses, locate information and then critically assess the information found in relation to the problems posed. And since ICT-enhanced learning is a new experience even for the teachers, the teachers become co-learners and discover new things along with their students.

A. Active learning

ICT-enhanced learning mobilizes tools for examination, calculation and analysis of information, thus providing a platform for student inquiry, analysis and construction of new information. Learners therefore learn as they do and, whenever appropriate work on real-life problems in-depth, making learning less abstract and more relevant to the learner’s life situation. In this way, and in contrast to memorization-based or rote learning, ICT-enhanced learning promotes increased learner engagement. ICT-enhanced learning is also “just-in-time” learning in which learners can choose what to learn when they need to learn it.

B. Collaborative learning

ICT-supported learning encourages interaction and cooperation among students, teachers, and experts regardless of where they are. Apart from modeling real-world interactions, ICT-supported learning provides learners the opportunity to work with people from different cultures, thereby helping to enhance learners’ teaming and communicative skills as well as their global awareness. It models learning done throughout the learner’s lifetime by expanding the learning space to include not just peers but also mentors and experts from different fields.

C. Creative Learning

ICT-supported learning promotes the manipulation of existing information and the creation of real-world products rather than the regurgitation of received information.

D. Integrative learning

ICT-enhanced learning promotes a thematic, integrative approach to teaching and learning. This approach eliminates the artificial separation between the different disciplines and between theory and practice that characterizes the traditional classroom approach.

E. Evaluative learning

ICT-enhanced learning is student-directed and diagnostic. Unlike static, text- or print-based educational technologies, ICT-enhanced learning recognizes that there are many different learning pathways and many different articulations of knowledge. ICTs allow learners to explore and discover rather than merely listen and remember.

IV. INTEGRATION OF TECHNOLOGY AS AN EVOLUTIONARY PROCESS

The effective integration of technologies into educational contexts may be considered as a process of transformation rather than a simple translation of traditional approaches to another medium. A framework that suggests a full integration of technology accompanied by significant changes in teaching practice as the third and final stage (transformation) of a continuum of adoption of technology in the learning environment. This third stage of transformation is preceded by first stage of entry (awareness of possibilities) and the second of adaptation (low-level integration).

An approach is to support the integration of new technologies with other instructional tools and strategies in the curriculum in ways that support a student centered approach and in so doing allowing technology use to be an integral part of “knowledge spaces” which “allow users to explore as they wish”

Consistent with learner-centered approaches the process begins with an analysis of learner characteristics and of learner needs in relation to the content that is to be ‘taught’. In defining the learner needs, the demands of the content must also be taken into account. “The content of student learning (what is taught) logically precedes the method of teaching content. Without content there is no teaching method. On the basis of this analysis of the learner and the content, clearly defined objectives and corresponding outcomes are formulated.

The integration of the technology in the learning space now becomes a problem solving exercise for the educator with the key question being: ‘In the light of learner needs and content requirements, how are each of these intended outcomes best achieved?’ In solving the problem, the educator must not neglect to take into account environmental attributes (e.g. location, available equipment, funding etc), which will constrain available strategy implementation process.

The strength of the integrated approach is twofold. Firstly, the focus is on the needs of the learner and the learning situation, not the technology. If technology is implemented it is done so on the basis of a learner-centered ‘needs analysis’ of the whole learning situation. In this way, the manner in which technology is implemented is inextricably linked with the learner needs and the subject requirements and objectives. The proposed approach does not necessarily demand the invention of new strategies to accommodate technology. The strategy that is finally implemented may have been used previously; it may be an improvement on an existing strategy or an entirely new strategy. Evidently, the process must not culminate with the implementation of the strategy. The final step is the most

critical for the development of a dynamic learning environment that meets the changing needs of learner and society. Execution of the strategy must be followed by a careful analysis of congruency of intended and actual outcomes.

CONCLUSION

Inappropriate use of technologies in the teaching and learning environment can be minimized through the approach suggested which does not focus primarily on technology but instead directs focus on learner needs, discipline requirements, learning outcomes and reflection on teaching practices. Technology implemented as an integral component of teaching and learning strategies formulated to meet learner and discipline needs is most likely to efficiently fulfill desired learning outcomes.

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